



## Reflective Action Instructional Design (RAID): A Designer's Aid

ROCCI LUPPICINI

*Concordia University, Department of Education, 1455 DE Maisonneuve Ouest, LB-579,  
H3G 1M8 Montreal, Quebec, Canada*

**ABSTRACT:** In recent years instructional design (ID) models have been a major focus of debate within the design community. The issue of creativity in ID is one area that has given rise to controversy. In this paper I present a topology of design questions and explore their potential contribution as a tool to promote reflection and designer discourse. First, I identify a topology of reflective action instructional design (RAID) questions. Next, I explore RAID within a community of design graduate students and its influences on design practices in terms of utility, originality, social contribution, and interest. Finally, I discuss ways to encourage reflection and designer discourse in design practice.

### INTRODUCTION

Instructional design (ID) students are schooled in some version or versions of instructional design models. The models provide the essential procedures of ID: learner analysis, task analysis, instructional strategy, formative and summative evaluation, subject matter knowledge, and knowledge of context. Typically, students carry out projects based on ID model procedures for grading. Issues concerning creative design practice are more difficult to articulate and even more difficult to agree on within design communities.

My focus in this paper is to explore the application of a design tool for promoting designer discourse and reflective dialogue between the designer and the context. The outcome may offer a useful tool that could help engage designers in reflection and critical social exchange while designing actual projects. My perspective is based on the assumption that reflective processes and social exchange are essential for communities of creative design practice.

### *Creativity in ID*

In recent years ID models have been a major focus of debate within the design community. The issue of creativity in ID is one area of ID that has given rise to controversy. Dick (1995) does not believe traditional instructional systems design (ISD) evaluation criterion prevents creative instruction in cases where the client places importance on creativity. Dick (1995) states, 'And the more experience they have at designing instruction, the more effective, the more efficient, and the more creative they will become'. Under this interpretation, creativity in design is a matter of designer expertise with ID models. Rowland (1995) points out problems of overreliance on ID

models and argues that conditions for producing creative ID are related to other factors like climate support of creative approach and participatory design. How exactly creative decision making takes place is not addressed in the ID literature. Nor are procedures offered for guiding creative decisions.

#### *Creativity and design knowledge*

Creativity in design is also viewed in relation to design knowledge and the challenge of articulating design knowledge and designers' judgement in procedural terms. Design knowledge includes explicit knowledge of the domain and procedures but also knowledge implicit design thinking and studio practices. A design research study by Heylighen et al. (1999) examines various types of knowledge that underlie the generation of a meaningful concept. The authors investigate which kinds of knowledge (implicit/explicit) underlie the development of a meaningful concept in architectural design. The authors examine student evaluation scores, teachers' evaluation scores, student evaluation scores after teacher input, videotaped coaching sessions between teacher and student, and student sketches. The results indicate that the implicit knowledge and studio work does play a role in the development of concept generation. From this perspective, the greatest challenge of creativity in design is that implicit design knowledge relevant to creative design processes is difficult to articulate in procedural terms. Similarly, Cross (2000) argues that designers have a special way of pursuing their profession, which he describes in terms of designerly ways of knowing, thinking, and acting.

In summary, viewing creativity in relation to design knowledge is linked to challenges in articulating design knowledge and proceduralizing design processes. Implicit design knowledge, contextual design knowledge, and designer specific ways of knowing are identified as potential obstacles to understanding creativity in design.

#### *On connecting ID theory and practice*

The issue of theory utility in practice is an area of controversy in many fields, especially those related to creative design practices. Linking theory and practice in innovative ways to advance reflective practice is a major concern in ID and related fields (Cole & Knowles 2000; Shön 1983).

Recent research efforts have turned to exploring educational practices and their relationship to ID. For instance, Moallem (1998) explores the relationship between expert teacher's thinking and practice with ID procedures. The possibility that ID models could benefit from observing teaching practices in a naturalistic setting is considered. Differences between generated conceptual models of teachers thinking compared to instructional systems design models resulted. Based on the results the following conclusions are made:

First, ID is a highly complex and spontaneous task that cannot be reduced to a set of procedures. Designers must have high-level thinking skills to address instructional problems and to use the process that is responsive to the learners and contexts.

Second, it is important to identify design problems in the context of specific instructional situations. Design problems that are context specific provide opportunities for the designer to solve the problem within the context that creates it.

Finally, ID is improved through social interaction or reflective dialogue between the designer and the context. This reflection-in-action guides the designer to reframe the problem and possible solutions (Moallem 1998, p. 61).

In summary, connecting theory and creative practice in ID is a major concern. There is limited research examining reflective educational practices within ID. Improving ID through social interaction and reflective dialogue between the designer and the context are innovative strategies identified.

### *The importance of reflection in design practice*

Reflection is perhaps the most powerful resource that individuals possess and advancing reflective practices is of key importance. Why? Reflection is necessary to uncover the tacit knowledge that impacts individuals' life actions. What makes reflection a useful resource for education lies in its referencing capacity. At the most basic level, reflection provides information concerning where ideas come from, which is essential for advancing learning or eliminating habits that prevent learning. This allows for important connections to occur between thoughts that otherwise remain unnoticed. Reflective techniques may aid designers to articulate implicit thinking in procedural terms.

Shön (1983) has made the distinction between reflection-in action and reflection-on action. Reflection-in action is described as a process during learning engagement that leads to adjustments in action and reflection-on action described as reflection that happens after an act is completed. What is important to consider is that there are many reflective actions involved in carrying out an instructional design project, reflections on what has happened already, what is currently happen, and what could happen.

Part of design thinking concerns creating something that does not already exist. Margolin (2000) believes design research has the dual function to increase knowledge of how to make products and to consider their effect on the social world. He states, 'Design research must also account for the practice-led courses that lead to new products.' This view of creativity in design may be characterized as a knowledge creation tool.

The idea of design as a knowledge creation tool along with Shön's theoretical contribution to the notion of 'reflective action' may be considered an important first steps in developing a topology of reflective practice for instructional designers. Developing a tool for promoting designer discourse and reflective dialogue could aid designers become more aware

of creative processes and decision making strategies when engaged in actual projects.

#### REFLECTIVE ACTION INSTRUCTIONAL DESIGN (RAID)

There are certain criteria to satisfy in constructing an ID tool useful for design research and practice. Margolin (2000) states, 'to qualify as design research, there must be reflection by the practitioner on the work, and the communication of some re-usable results from that reflection.' My own criteria are that tools suitable for design research and practice must be flexible enough to accommodate the changing landscape of the design process and to foster design reflections that may be shared within a design community.

I take into consideration the steps to be followed (what to do) as well as how those steps are followed (how to do it), when they are to be followed (when to do it), and with whom to follow the steps with (who to do it with). This allows for the possibility of contextually sensitive communicable results. To this end, the RAID aid addresses multiple areas of consideration: *the design processes and products, the design situation, and the implication of self and others in the design*. The topology of reflective design questions is intended to be used as a baseline for any ID project. An overview of RAID is provided:

##### **Actor referenced reflective practices**

Reflections-on-others: What is the role of others involved?  
 Reflections-from others: What do they think?  
 Reflections-on self: What do I think of my self and my role in practice?

##### **Action referenced reflective practices**

Reflection-to action: What led to this action?  
 Reflection-in-action: What is happening now?  
 Reflection-on-action: What happened so far?  
 Reflection-from-action: What could happen?

##### **Situation referenced reflective practices**

Reflections-to-situation: What expectations do I have about the setting?  
 Reflections-on-situation: What do I think about the setting?  
 Reflections-from-situation: How would I change the setting?

The idea for RAID came from observing difficulties people had in discussing their design ideas in a group setting. RAID is an original contribution that has relevant connections to ID research and practice. RAID includes key design questions that arise at multiple stages of project design. Designers may use it at the different stages of project development and for different purposes. It is intended to be compatible with any of the accepted design models. It may be applied both to collaborative design and individual design efforts. The reflective design questions can be administered by other designers, self-administered, or administered in some

combination of both at different stages. The questions are designed to be used in a variety of ways to meet the requirements of the different design contexts.

#### APPLYING RAID TO A DESIGN CONTEXT

Before applying RAID in a design context I had students comment on the clarity of questions. A few alterations were made to question wording. One person had difficulty with the wording of two questions and additional wording was added:

Reflection-on-action: 'What happened?' I Added 'What brought you to this?'  
 Reflection-from-action: 'What could happen?' I added, 'What could work?'

#### *Reflections on RAID application*

I apply RAID in a population of graduate students enrolled in a design course during weekly labs scheduled for sharing of design ideas. None of the RAID users had participated in similar activities. RAID questions are administered orally during focus group discussion. Participant perceptions on design actions, situational factors, and involvement of self and others are recorded. The exercise is intended to aid students to situate design ideas in a community of designers, judge personal attachment to design ideas, and judge their willingness to compromise their artistic vision. The exercise is also intended to aid design students increase their awareness of design processes that are often implicit and difficult to situate. We discuss responses in small focus groups during weekly labs and exchange individual reflections on design issues.

Students responding to the RAID questions make a number of connections to their own design projects. For instance, in a studio-based *Japanese garden design project*, responses to the RAID questions reveal important background information required to appreciate the rationale for the design:

Action referenced reflective practices	Responses
Reflection-to action: What led to this action?	I lived in Japan and chose a Japanese concept. I was never good at interior design and wanted to improve.
Reflection-in-action: What is happening?	I am thinking about making design more 3-D and adding lacquer.
Reflection-on-action: What happened? Or What brought you to this?	After drawing on paper I made a model with wood where levels could be seen.
Reflection-from-action: What could happen? What could work?	I could save sand by raising levels of the Zen garden.

RAID questions aid students in situating their design ideas in a community of designers as well as the designers personal attachment to those ideas and willingness to compromise their artistic vision:

**Actor referenced reflective practices**

Reflections-on-others: What is the role of others involved?

Reflections-from others: What do they think?  
Reflections-on self: What do I think of my self and my role in practice?

**Responses**

Only I am involved in the design. It would give others an aesthetically pleasing place to visit.

Classmates like realistic model. It is tangible. My ideas of simplicity govern design. Others ideas cluttered my simplification.

RAID questions are also useful aids for probing for design thinking that may not be typically communicated in group discussions. For instance, in *the roller blade carrier design*, additional probing enabled the designer to articulate a strength of the project that was not explicit beforehand:

**Situation referenced reflective practices**

Reflections-to-situation: What expectations do I have about the setting?

Reflections-on-situation: What do I think about the setting?

Reflections-from-situation: How would I change the setting?

**Responses**

Regular town travel, traffic, hills etc.

I wish there were fewer hills. There are nice pockets of places across town.

I would remove hills. Good skaters do go in traffic but beginners don't.

(Probing) Also a strap does not exist. I could target the beginner skater market because they carry their skaters more. I would call it the STRAP.

Responding to RAID questions influence design practices on dimensions of personal and social contribution. RAID responses during the *classroom design project* exemplify the importance of personal interest in design decision making:

**Action referenced reflective practices**

Reflection-to action: What led to this action?

Reflection-in-action: What is happening?

Reflection-on-action: What happened? Or What brought you to this?

Reflection-from-action: What could happen? What could work?

**Responses**

I am a teacher. There is need to change the classroom design to meet educational reforms.

There are desk centered classrooms with computers in front

I have observed limits in the present class design through work experience.

The classroom could be less structured with more space. This could be a good classroom management model.

RAID responses during the classroom design project exemplify the importance of rationalising situational constraints in design decision making where other stakeholders are involved in the design project outcome:

**Actor referenced reflective practices**

Reflections-on-others: What is the role of others involved?

Reflections-from others: What do they think? How do I sell it?

Reflections-on self: What do I think of my self and my role in practice? Why this design?

**Responses**

There are administrative considerations. Principle would have to get funding.

It would be expensive. They would react.

I would make the changed classroom generalizable so the design could be used for other classrooms.

## CONCLUSION

RAID questions were fairly easy to respond to and informative of design thinking. The questions are general enough to be applied to a wide range of design projects. RAID is employed in various design projects: Japanese style bedrooms, women's assertiveness training program, and classroom design. RAID contributes to the design community by helping change private design thinking into a concrete form that may be communicated in a design community. Margolin (2000) remarks that the practices of designing and using tend to go unexamined. He believes that a design community with a much denser research culture would help us respond on a much deeper level to product innovations by thoroughly studying their effect on society. RAID provides stimulus for design discussion to begin.

Another potential usage of RAID questions could be to preserve self-esteem in situations beyond designer control and to promote personal creative expression in design. In cases where there is little designer power in project decision making, RAID may help designers identify other meaningful aspects of the project to focus attention. RAID may be used in almost any design context where creativity and contextual considerations are important. Where implicit knowledge lays imbedded in particularity of the social context in the design studio, RAID may be employed to make ideas explicit.

There are also limitations to RAID. For one, the relatively small number of participants involved in this qualitative report has limited generalizability to other similar design contexts. Moreover, there is a general paucity of experimental studies within the design literature investigating complex processes. Part of the problem may be attributed to the difficulty of studying complex learning processes, which are often implicit and difficult to operationalize. Part of problem may also be that researchers are not investing effort to set up carefully planned experimental research studies to validate their design models. A second problem revolves around the limited application of RAID. It is not necessarily the case that RAID will be useful in all situations. Responding to RAID requires time and energy. This is not always possible under situations of time constraints. RAID would be less useful in design contexts where creativity and contextual considerations are not important. Where design processes are determined mainly by the client or existing standards, there may be little implicit designer knowledge to explore. In situations where more 'designerly ways of thinking' are not valued, following a RAID model could be a liability.

## REFERENCES

- Cross, N.: 2000, 'Designerly Ways of Knowing: Design Discipline Versus Design Science', in *Design plus research*, Proceedings of the Politecnico di Milano Conference.
- Cole, A. & Knowles, J.: 2000, *Researching Teaching: Exploring Teacher Development through Reflexive Inquiry*, Allyn and Bacon, Boston.

- Dick, W.: 1995, 'Instructional Design and Creativity: A Response to the Critics', *Educational Technology* **34** (4), 5–11.
- Heylighen, A., Neuckermans, H. & Bouwen, E.: 1999, 'Walking a Thin Line-between Passive Knowledge and Active Knowing of Components and Concepts in Architectural Design', *Design Studies* **20**, 211–235.
- Holt, J.: 1997, 'The Designer's Judgement', *Design Studies* **18**, 113–123.
- Margolin, V.: 2000, 'Building a Design Research Community', in *Design Plus Research*, Proceedings of the Politecnico di Milano Conference.
- Moallem, M.: 1998, 'An Expert Teacher's Thinking and Teaching and Instructional Design Models and Principles: An Ethnographic Study', *Educational Technology Research and Development* **46**(2), 37–64.
- Rowland, D.: 1995, 'Instructional Design and Creativity: A Response to the Criticized', *Educational Technology* **34**(5), 17–22.
- Schön, D.: 1983, *The Reflective Practitioner: How Professionals Think in Action*, Basic Books, New York.



Copyright of International Journal of Technology & Design Education is the property of Kluwer Academic Publishing / Academic and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.

Copyright of International Journal of Technology & Design Education is the property of Springer Science & Business Media B.V. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.